

# Construction

(SIC 15, 16, 17)

## SIGNIFICANT POINTS

- Construction is one of the economy's largest industries.
- Over 8 out of 10 establishments employ fewer than 10 people.
- Construction has a very large number of self-employed workers.
- Job prospects for construction workers are expected to be good.
- Workers in construction have relatively high hourly earnings.

### Nature of the Industry

Houses, apartments, factories, offices, schools, roads, and bridges are only some of the products of the construction industry. This industry's activities include work on new structures as well as additions, alterations, and repairs. (Some government establishments do the same work and employ a significant number of people, but information about them is not included in this statement. Information concerning government construction is included in the *Career Guide* statements on Federal Government and State and local government, excluding education and hospitals.)

The construction industry is divided into three major segments: General building contractors, heavy construction contractors, and special trade contractors. *General building contractors* build residential, industrial, commercial, and other buildings. *Heavy construction contractors* build sewers, roads, highways, bridges, tunnels, and other projects. *Special trade contractors* are engaged in specialized activities such as carpentry, painting, plumbing, and electrical work.

Construction is usually done or coordinated by *general contractors*, who specialize in one type of construction such as residential or commercial building. They take full responsibility for the complete job, except for specified portions of the work that may be omitted from the general contract. Although general contractors may do a portion of the work with their own crews, they often subcontract most of the work of the construction to heavy construction or special trade contractors.

Special trade contractors usually do the work of only one trade, such as painting, carpentry, electrical work, or two or more closely related trades, such as plumbing and heating or plastering and lathing. Beyond fitting their work to that of the other trades, they have no responsibility for the structure as a whole. They obtain orders for their work from general contractors, architects, or property owners. Repair work is almost always done on direct order from owners, occupants, architects, or rental agents.

### Working Conditions

Most workers in this industry work full time, many over 40 hours a week. In 1998, more than 1 in 5 wage and salary construction workers worked 45 hours or more a week; over half of self-employed individuals worked over 45 hours a

week. Construction craftworkers may sometimes work evenings, weekends, and holidays to finish a job or take care of an emergency.

Construction workers need sufficient physical stamina because work frequently requires prolonged standing, bending, stooping, and working in cramped quarters. Exposure to weather is common because much of the work is done outside or in partially enclosed structures.

Construction workers often work with potentially dangerous tools and equipment amidst a clutter of building materials; some work on temporary scaffolding and in bad weather. Consequently, they are more prone to injuries than workers in other jobs. In 1997, cases of work-related injury and illness were 9.5 per 100 full-time workers, which is significantly higher than the 7.1 rate for the entire private sector. Workers who do roofing, masonry, stonework, and plastering experienced the highest injury rates. In response, employers increasingly emphasize safe working conditions and work habits that reduce the risk of injuries.

### Employment

Construction, with 6 million wage and salary and 1.6 million self-employed nongovernment jobs in 1998, was one of the Nation's largest industries.

About 1 out of 5 jobs were with special trade contractors, primarily plumbing, electrical, and masonry contractors. Almost 2 out of 3 jobs were with general building contractors, mostly in residential and nonresidential construction. The rest were with road and other heavy construction contractors (table 1). Employment in this industry is distributed geographically in much the same way as the Nation's population; the concentration of employment is generally in industrialized and highly populated areas.

There were about 667,000 construction companies in the United States in 1997: 197,091 were general contractors and operative builders; 37,701 were heavy construction or highway contractors; and 431,877 were specialty trade contractors. Most of these establishments tend to be small, the majority employing fewer than 10 workers (chart). About 8 out of 10 workers are employed by small contractors.

Construction offers more opportunities than most other industries for individuals who desire to own and run their own business. The 1.5 million self-employed and unpaid family workers in 1998 performed work directly for property owners

or acted as contractors on small jobs, such as additions, remodeling, and maintenance projects. The large majority of self-employed work in the construction trades. The rate of self-employment varies greatly by individual occupation in the construction trades (see chart on next page).

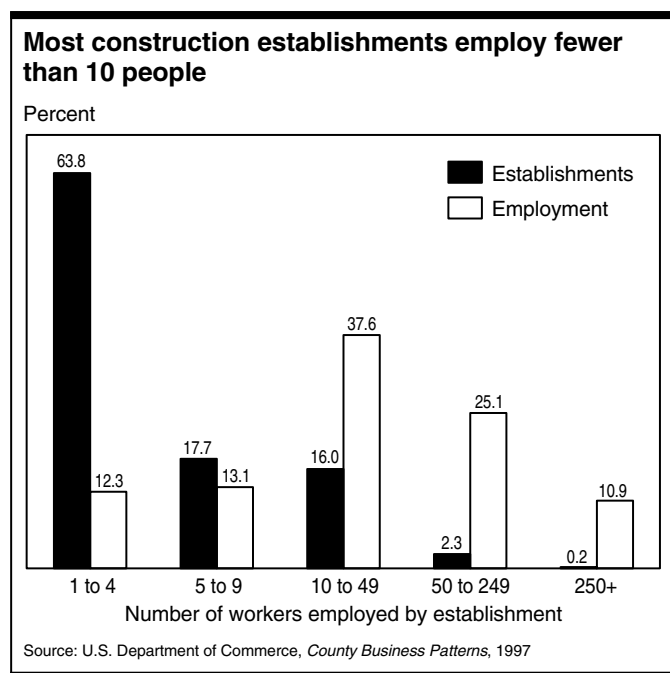
**Table 1. Nongovernment wage and salary employment in construction, 1998**

(Employment in thousands)

	1998 Employment	1998-2008 Percent change
<b>Total</b> .....	5,985	9.2
<b>General building contractors</b> .....	1,372	7.6
Residential building construction .....	700	11.3
Operative builders .....	27	-3.7
Nonresidential building construction .....	646	4.1
<b>Heavy construction contractors</b> .....	838	4.9
Highway and street construction .....	253	10.2
Heavy construction, except highways .....	585	2.6
<b>Special trade contractors</b> .....	3,774	10.7
Plumbing, heating, and air-conditioning .....	827	10.2
Painting and paper hanging .....	204	8.9
Electrical work .....	727	12.2
Masonry, stonework, and plastering .....	499	9.3
Carpentering and floor work .....	274	9.7
Roofing, siding, and sheet metal work .....	250	12.3
Concrete work .....	327	7.7
Water well drilling .....	23	13.5
Miscellaneous special trade .....	644	12.7

### Occupations in the Industry

Work in construction offers a great variety of career opportunities. People with many different talents and educational backgrounds—managers, clerical workers, skilled craftworkers, semiskilled workers, and laborers—find job opportunities in construction and related activities (table 2).



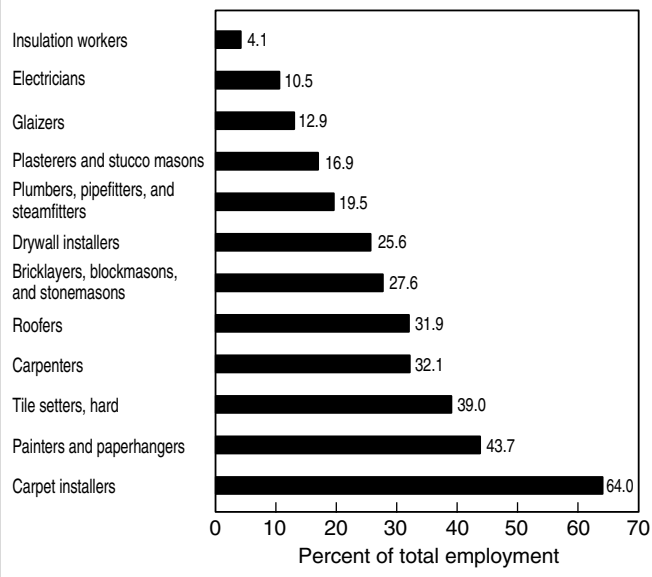
**Table 2. Employment of nongovernment wage and salary workers in construction by occupation, 1998 and projected change, 1998-2008**

(Employment in thousands)

Occupation	1998 Employment Number	1998 Percent	1998-2008 Percent change
<b>All occupations</b> .....	5,985	100.0	9.2
<b>Precision production, craft, and repair</b> .....	3,319	55.5	11.5
Carpenters .....	567	9.5	7.8
Electricians .....	387	6.5	14.4
Blue collar worker supervisors .....	293	4.9	16.0
Plumbers, pipefitters, and steamfitters .....	254	4.3	6.5
Construction equipment operators ..	185	3.1	9.7
Painters and paperhangers .....	173	2.9	12.5
Heating, air conditioning, and refrigeration mechanics and installers .....	144	2.4	18.3
Cement masons, concrete finishers, and terrazzo workers .....	126	2.1	7.0
Sheet metal workers and duct installers .....	122	2.0	25.9
Drywall installers and finishers .....	118	2.0	9.2
Bricklayers and stone masons .....	110	1.8	16.9
Roofers .....	107	1.8	6.9
Machinery mechanics, installers, and repairers .....	82	1.4	7.4
Structural and reinforcing metal workers .....	77	1.3	7.7
Insulation workers .....	58	1.0	8.4
<b>Operators, fabricators, and laborers</b> ..	1,142	19.1	6.7
Helpers, construction trades .....	537	9.0	7.5
All other helpers, laborers, and material movers, hand .....	289	4.8	-1.0
Truck drivers .....	136	2.3	10.6
Excavation and loading machine operators .....	75	1.3	22.6
<b>Executive, managerial, and administrative</b> .....	636	10.6	9.6
General managers and top executives .....	257	4.3	7.7
Construction managers .....	188	3.2	12.4
Cost estimators .....	89	1.5	12.9
Financial managers .....	41	0.7	4.1
<b>Administrative support, including clerical</b> .....	536	9.0	-1.5
General office clerks .....	152	2.6	12.0
Secretaries .....	145	2.4	-11.7
Bookkeeping, accounting, and auditing clerks .....	132	2.2	-9.6
<b>Agriculture, forestry, fishing, and related</b> .....	144	2.4	10.1
Laborers, landscaping and groundskeeping .....	143	2.4	10.1
<b>Marketing and sales</b> .....	97	1.6	13.3
<b>All other occupations</b> .....	111	1.9	9.8

Most of the workers in construction are skilled craftworkers or laborers, helpers, and apprentices who assist the more skilled workers. These groups represent 75 percent of the industry's employment; over 56 percent are construction craftworkers. *Construction craftworkers* are generally classified as either structural, finishing, or mechanical workers. *Structural workers* include carpenters, operating engineers (construction machinery operators), bricklayers, cement masons, stonemasons, and reinforcing metal

### Many construction occupations have a substantial percentage of self-employed workers



workers. *Finishing workers* include lathers, plasterers, marble setters, terrazzo workers, carpenters, ceiling installers, drywall workers, painters, glaziers, roofers, floor covering installers, and insulation workers. *Mechanical workers* include plumbers, pipefitters, construction electricians, sheet metal workers, and heating, air-conditioning, and refrigeration technicians.

The greatest number of construction craftworkers worked as carpenters, electricians, plumbers, pipefitters, painters, concrete and terrazzo workers, bricklayers, and drywall installers. The construction industry employs nearly all of the workers in some construction craft occupations—such as plasterers, roofers, structural metal workers, and drywall installers. In other construction crafts occupations—for example, electricians, painters and paperhangers, plumbers, and carpet installers—large numbers also work in other industries (table 3). Other industries employing large numbers of construction craftworkers include transportation equipment manufacturing, transportation and public utilities, wholesale and retail trade, educational services, and State and local government.

Many persons enter the construction crafts through apprenticeship programs. These programs offer on-the-job training under the close supervision of a craftsman, as well as some formal classroom instruction. Depending on the trade, apprentices learn a variety of skills, ranging from laying brick to putting together steel beams.

Many persons advance to construction craft occupations from related, less skilled jobs as *helpers* or *laborers*. They acquire skills while they work. They are first hired as laborers or helpers, performing a variety of unskilled tasks and providing much of the routine physical labor needed in construction. They erect and dismantle scaffolding, clean up debris, help unload and carry materials and machinery, and operate simple equipment. They work alongside experienced craftworkers, learning the basic skills of a particular craft. After acquiring experience and skill in various phases of the craft, they may become skilled journey level craftworkers.

To develop their skills further after training, construction craftworkers may work on many different projects, such as housing developments, office and industrial buildings, or highways, bridges, and dams. Flexibility and a willingness to adopt new techniques, as well as the ability to get along with people, are essential for advancement. Those skilled in all facets of the trade and who show good leadership qualities may be promoted to *supervisor*. As supervisors, they oversee craftworkers and helpers and insure work is done well. They plan the job and solve problems as they arise. Those with good organizational skills and exceptional supervisory ability may advance to *superintendent*. Superintendents are responsible for getting a project completed on schedule by working with the architect's plans, making sure materials are delivered on time, assigning work, overseeing craft supervisors, and making sure every phase of the project is completed properly and expeditiously. They also resolve problems and see to it that work proceeds without interruptions. Superintendents may advance to large projects as general managers and top executives. Some go into business for themselves as contractors.

**Table 3. Percent of wage and salary workers in construction craft occupations employed in the construction industry, 1998**

Occupation	Employed
Roofers .....	99.6
Drywall installers and finishers .....	97.2
Bricklayers and stone masons .....	96.8
Plasterers and stucco masons .....	96.6
Cement masons, concrete finishers, and terrazzo workers .....	95.6
Insulation workers .....	90.2
Carpenters .....	78.4
Plumbers, pipefitters, and steamfitters ...	74.1
Carpet, floor, and tile installers and repairers .....	73.8
Structural and reinforcing metal workers ...	69.8
Electricians .....	65.8
Glaziers .....	64.7
Painters and paperhangers .....	64.6

Other workers in the construction industry operate material-moving machines and other construction equipment. Such workers include operating engineers; grader, bulldozer, and scraper operators; and paving, surfacing, and tamping equipment operators. They move construction debris, earth, and other heavy materials, and apply asphalt and concrete to roads and other substructures. They may also set up and inspect equipment, make adjustments, and perform minor repairs.

### Training and Advancement

Persons may enter most jobs in the construction industry without any formal classroom training after high school. Laborers can learn their job in a few days, but the skills required for many jobs are substantial, although they can usually be learned on the job. Skilled workers such as carpenters, bricklayers, plumbers, and other construction trade specialists either need several years of informal on-the-job experience, or apprenticeship training. Workers pick up skills by working alongside more experienced workers, and through instruction provided by their employers. As they demonstrate their ability to perform tasks they are assigned, they move to progressively

more challenging work. As they broaden their skills, they are allowed to work more independently, and responsibilities and earnings increase. They may qualify for jobs in related, more highly skilled, occupations. For example, after several years of experience painters' helpers may become journey level painters.

Apprenticeships administered by local employers, trade associations, and trade unions provide the most thorough training. Apprenticeships usually last between 3 and 5 years and consist of on-the-job training and 144 hours or more of related classroom instruction. A number of apprenticeship programs are beginning to use competency standards instead of just time requirements. This allows a more competent person to complete the program in a shorter amount of time. Those who enroll in apprenticeship programs usually are least 18 years old and in good physical condition.

Persons can enter the construction industry with a variety of educational backgrounds. Those entering construction right out of high school start as laborers, helpers, or apprentices. Those who enter construction from technical or vocational schools may also go through apprenticeship training; however, they progress at a somewhat faster pace because they already have had courses such as mathematics, mechanical drawing, and woodworking. Skilled craftworkers may advance to supervisor or superintendent positions, or may transfer to jobs as construction building inspector, purchasing agent, sales representative for building supply companies, contractor, and technical or vocational school instructor.

Executive, administrative, and managerial personnel usually have a college degree or considerable experience in their specialty. Individuals who enter construction with college degrees usually start as management trainees or construction managers' assistants. Those who receive degrees in construction science often start as field engineers, schedulers, or cost estimators. College graduates may advance to positions as assistant manager, construction manager, general superintendent, cost estimator, construction building inspector, general manager or top executive, contractor, or consultant. Although a college education is not always required, administrative jobs are usually filled by people with degrees in business administration, finance, accounting, or similar fields.

Opportunities for workers to form their own firms are better in construction than in many other industries. Construction workers need only a moderate financial investment to become contractors and they can run their businesses from their homes, hiring additional construction workers only as needed for specific projects. The contract construction field, however, is very competitive, and the rate of business failure is high.

## Earnings

Earnings in construction are significantly higher than the average for all industries (table 4). In 1998, production or nonsupervisory workers in construction averaged \$16.56 an hour, or about \$643 a week. Average earnings of workers in the special trade contractors segment were somewhat higher than those working for building or heavy construction contractors.

Earnings of workers in the construction industry vary largely depending on education and experience of the worker, type of work, the size and nature of the construction project,

its geographic location, and economic conditions. Earnings of construction trade workers are also often affected by poor weather. Traditionally, winter is the slack period for construction activity, especially in colder parts of the country. Some workers, such as laborers or roofers, may not work for several months. Heavy rain may also slow or even stop work on a construction project. Because construction trades are dependent on one another—especially on large projects—work delays in one trade delay or stop the work in another. Earnings in selected occupations in construction in 1997 appear in table 5.

**Table 4. Average weekly and hourly earnings by nongovernment construction industry sector, 1998**

Industry segment	Weekly	Hourly
<b>Total, private industry</b> .....	\$442	\$12.77
<b>Construction industry</b> .....	643	16.56
<b>General building contractors</b> .....	602	15.87
Residential building contractors .....	543	14.83
Operative builders .....	573	15.17
Nonresidential building contractors .....	665	16.91
<b>Heavy construction, except building</b> ....	683	16.15
Highway and street construction .....	696	16.22
Heavy construction, except highway .....	679	16.12
<b>Special trade contractors</b> .....	646	16.90
Plumbing, heating, and air conditioning .....	674	17.16
Painting and paper hanging .....	562	15.22
Electrical work .....	732	18.40
Masonry, stonework, and plastering .....	601	16.73
Carpentry and floor work .....	596	16.46
Roofing, siding, and sheet metal work .....	509	14.74

About 20 percent of all workers were union members or were covered by union contracts, compared to 15.4 percent of workers throughout private industry. Many different unions represent the various construction trades and form joint apprenticeship committees with local employers to supervise apprenticeship programs.

## Outlook

Employment of wage and salary jobs in the construction industry is expected to grow about 9 percent through the year 2008, slower than the average for all industries. Over the 1998-2008 period, employment growth is projected to add about 550,000 new jobs in construction. Many openings will also result each year from the need to replace experienced workers who leave jobs in the industry.

Employment in this industry depends primarily on the level of construction and remodeling activity. New construction is usually cut back during periods when the economy is not expanding, and the number of job openings in construction fluctuates greatly from year to year. Employment growth in the various segments of the construction industry varies somewhat, depending on the projected demand for what the industry is hired to construct.

Employment in residential construction is expected to grow slowly because the anticipated slowing of population growth and household formation will reduce the demand for new housing units. The aging of the population will reduce the demand for larger single-family homes. In addition,

higher home prices will make ownership less affordable. Slow employment growth is also expected in nonresidential construction, because the demand for commercial buildings will be lessened by technological trends favoring telecommuting, electronic shopping, home offices, teleconferencing, and globalization of information services, as well as business management practices in downsizing, temporary workforces, and inventory reduction. Industrial construction, however, is expected to be stronger because exports by the manufacturing sector of the economy are expected to increase. Replacement of many industrial plants has been delayed for years, and a large number of structures will have to be replaced or remodeled. Construction of nursing, convalescent homes, and other extended care institutions will also increase for several reasons: The aging of the population, the increasing use of high technology medical treatment facilities, and the need for more drug treatment clinics. Construction of schools will also increase to accommodate the children of the “baby-boom” generation.

**Table 5. Median hourly earnings of the largest occupations in construction, 1997**

Occupation	General building contractors	Heavy construction, except buildings	Special trade contractors	All industries
General managers and top executives ....	\$28.12	\$30.33	\$24.18	\$26.05
Construction managers ..	21.13	22.27	21.44	21.95
First-line supervisors and managers/supervisors-construction trades and extractive occupations .....	18.32	18.28	17.77	18.28
Electricians .....	14.42	16.97	16.10	16.54
Plumbers, pipefitters, and steamfitters .....	14.67	15.55	16.02	16.14
Carpenters .....	13.21	15.49	14.33	13.38
Secretaries, except legal and medical .....	10.17	10.27	9.41	11.00
Helpers, carpenters and related workers .....	8.92	9.35	9.36	9.16
General office clerks .....	8.88	9.06	8.80	9.10
Painters and paperhangers, construction and maintenance .....	10.94	—	11.59	11.59

Employment in heavy construction is projected to increase about as fast as the industry average. Growth is expected in highway, bridge, and street construction, as well as repairs to prevent further deterioration of the Nation’s highways and bridges. Bridge construction is expected to increase the fastest due to the serious need to repair or replace structures before they become unsafe. Poor highway conditions will also result in increased demand for highway maintenance and repair. Congress recently passed a six-year public works bill designed to provide money for such construction projects, including building mass transit systems.

Employment in special trades contracting, the largest segment of the industry, should grow a little faster than the entire construction industry. Demand for special trades subcontractors in building and heavy construction is rising, and at the same time, more workers will be needed to repair and

remodel existing homes. Home improvement and repair construction is expected to continue to grow faster than new home construction. Remodeling should be the fastest growing sector of the housing industry because of a growing stock of old residential and non-residential buildings. Many “starter” units will be remodeled to appeal to more affluent, space and amenity hungry buyers. Also, some of the trade-up market may result in remodeling and additions rather than new larger homes. Remodeling tends to be more labor-intensive than new construction.

Employment growth will differ among various occupations in the construction industry. Employment of construction managers is expected to grow as a result of advances in building materials and construction methods, as well as a proliferation of laws dealing with building construction, worker safety, and environmental issues. Construction managers with a bachelor’s degree in construction science with an emphasis on construction management, and who acquire work experience in construction management services firms, should have an especially favorable job outlook. Administrative support occupations are expected to decline due to increased office automation.

Although employment in construction trades is expected to grow about as fast as the industry average, the rate of growth will vary among the various trades. Employment of bricklayers, electricians, sheet metal workers and duct installers, painters, and heating, air-conditioning, and refrigeration technicians should grow faster than the industry average because technological changes are not expected to offset employment demand as construction activity grows. Employment of carpenters; cement masons, concrete finishers, and terrazzo workers; plumbers; and structural metal workers is expected to grow somewhat more slowly than average because the demand for these workers is expected to be offset by a greater use of new materials and equipment. For example, increasing use of prefabricated components in residential construction is expected to reduce the demand for carpenters.

Many industry sources feel job opportunities are excellent in most construction crafts because there are shortages of skilled workers and adequate training programs. The shortage situation may worsen between 1998 and 2008 because the pool of young workers available to enter training programs will be increasing slowly, and many in that group are reluctant to seek training for jobs that may be strenuous and have uncomfortable working conditions.

### Sources of Additional Information

Information about apprenticeships and training can be obtained from local construction firms and employer associations, the local office of the State employment service or State apprenticeship agency, or the local office of the Bureau of Apprenticeship and Training, U.S. Department of Labor.

For additional information on jobs in the construction industry, contact:

- Associated Builders and Contractors, 1300 North 17th St. NW., Rosslyn, VA 22209.
- Associated General Contractors of America, Inc., 1957 E St. NW., Washington, DC 20005.
- National Association of Home Builders, 15th and M Sts. NW., Washington, DC 20005.

Additional information on occupations in construction may be found in the 2000-01 *Occupational Outlook Handbook*:

- Bricklayers and stonemasons
- Carpenters
- Carpet, floor, and tile installers and finishers
- Cement masons, concrete finishers, and terrazzo workers
- Construction and building inspectors
- Construction equipment operators
- Construction managers
- Drywall installers and finishers
- Electricians
- Glaziers
- Handlers, equipment cleaners, helpers, and laborers
- Heating, air-conditioning, and refrigeration mechanics and installers
- Insulation workers
- Material moving and equipment operators
- Painters and paperhangers
- Plasterers and stucco masons
- Plumbers, pipefitters and steamfitters
- Roofers
- Sheet metal workers and duct installers
- Structural and reinforcing metal workers